

Molecular tectonics: Manganese(II), copper(II) and zinc(II) 1D coordination polymers based on tetramercaptothiacalix[4]arene bearing benzoate coordinating groups

Ovsyannikov A., Ferlay S., Solovieva S., Antipin I., Konovalov A., Kyritsakas N., Hosseini M.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© ISUCT Publishing. The combination under mild conditions of the carboxylic appended tetramercaptotetrathiacalix[4]arene (TMTCA) derivative 2 blocked in 1,3-A conformation with acetate salts of octahedral copper(II), manganese(II) and zinc(II), and pyridine, leads to the formation of new 1D coordination polymers in the crystalline state. Whereas for copper(II) and manganese(II) 1D linear coordination polymers are observed, for zinc(II) a zigzag chain has been evidenced.

<http://dx.doi.org/10.6060/mhc170295o>

Keywords

Carboxylate, Coordination polymer, Molecular tectonics, Tetramercaptotetrathiacalix[4]arene, Transition metals

References

- [1] Abrahams B.F., Hoskins B.F., Robson R. J. Am. Chem. Soc. 1991, 113, 3606
- [2] Batten S.R., Robson R. Angew. Chem. Int. Ed. 1998, 37, 1460.
- [3] Blake A.J., Champness N.R., Hubberstey P., Li W.-S., Withersby M.A., Schröder M. Coord. Chem. Rev. 1999, 193, 117
- [4] Moulton B., Zaworotko M.J. Chem. Rev. 2001, 101, 1629
- [5] Eddaoudi M., Moler D.B., Li H., Chen B., Reineke T.M., O'Keeffe M., Yaghi O.M. Acc. Chem. Res. 2001, 34, 319
- [6] Janiak C. Dalton Trans. 2003, 2781
- [7] Carlucci L., Ciani G., Proserpio D.M. Coord. Chem. Rev. 2003, 246, 247
- [8] Kitagawa S., Kitaura R., Noro S. Angew. Chem. Int. Ed. 2004, 43, 2334
- [9] Férey G., Mellot-Draznieks C., Serre C., Millange F. Acc. Chem. Res. 2005, 38, 218
- [10] Bradshaw D., Claridge J.B., Cussen E.J., Prior T.J., Rosseinsky M.J. Acc. Chem. Res. 2005, 38, 273
- [11] Kitagawa S., Uemura K. Chem. Soc. Rev. 2005, 34, 109
- [12] Maspoch D., Ruiz-Molina D., Veciana J. Chem. Soc. Rev. 2007, 36, 770
- [13] Long J.R., Yaghi O.M. Chem. Soc. Rev. 2009, 38, 1213
- [14] Janiak C., Vieth J.L. New J. Chem. 2010, 34, 2366
- [15] Chem. Soc. Rev. 2009, 38, Themed Issue on Metal–Organic Frameworks
- [16] Leong W.L., Vittal J.J. Chem. Rev. 2011, 111, 688

- [17] Chem. Rev. 2012, 112, Metal-Organic Frameworks Special Issue.
- [18] Hosseini M.W. Cryst. Eng. Commun. 2004, 6, 318.
- [19] Simard M., Su D., Wuest J.D. J. Am. Chem. Soc. 1991, 113, 4696
- [20] Mann S. Nature 1993, 365, 499
- [21] Wuest J.D. Chem. Commun. 2005, 5830
- [22] Hosseini M.W. Chem. Commun. 2005, 5825.
- [23] Hosseini M.W. Acc. Chem. Res. 2005, 38, 313.
- [24] Gutsche C.D. In: Calixarenes Revised: Monographs in Supramolecular Chemistry. Cambridge: The Royal Society of Chemistry, 1998
- [25] Asfari Z., Böhmer V., Harrowfield J., Vicens J. In: Calixarenes 2001. (Asfari Z., Böhmer V., Harrowfield J., Vicens J., Eds.) Dordrecht: Kluwer Academic, 2001
- [26] Hosseini M.W. ACS Series 2000, 557, 296.
- [27] Kumagai H., Hasegawa M., Miyanari S., Sugawa Y., Sato Y., Hori T., Ueda S., Kamiyama H., Miyano S. Tetrahedron Lett. 1997, 38, 3971.
- [28] Rao P., Hosseini M.W., De Cian A., Fischer J. Chem. Commun. 1999, 2169
- [29] Akdas H., Graf E., Hosseini M.W., de Cian A., Bilyk A., Skelton B.W., Koutsantonis G.A., Murray I., Harrowfield J.M., White A.H. Chem. Commun. 2002, 1042.
- [30] Mislin G., Graf E., Hosseini M.W., De Cian A., Kyritsakas N., Fischer J. Chem Commun. 1998, 2545
- [31] Kozlova M.N., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Dalton Trans. 2007, 5126
- [32] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Russ. Chem. Bull. 2015, 64, 1955.
- [33] Kozlova M.N.K., Ferlay S., Kyritsakas N., Hosseini M.W., Solovieva S.E., Antipin I.S., Konovalov A.I. Chem. Commun. 2009, 2514.
- [34] Dalgarno S.J., Claudio-Bosque K.M., Warren J.E., Glass T.E., Atwood J.L. Chem. Commun. 2008, 1410
- [35] Akdas H., Graf E., Hosseini M.W., De Cian A., Harrowfield J.M. Chem. Commun. 2000, 2219
- [36] Park K-M., Lee E., Park C.S., Lee S.S. Inorg. Chem. 2011, 50, 12085
- [37] Kim J.-Y., Kim K., Park K-M., Lee S.S. Bull. Korean Chem. Soc. 2014, 35, 289
- [38] Lee E., Kim Y., Heo J., Park K-M. Cryst. Growth Des. 2015, 15, 3556
- [39] Lee E., Ju H., Moon S.-H., Kang Y., Park K.-M. Bull. Korean Chem. Soc. 2015, 36, 2124.
- [40] Ovsyannikov A., Lang M.N., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Dalton Trans. 2013, 42, 116
- [41] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Dalton Trans. 2013, 42, 9946
- [42] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Inorg. Chem. 2013, 52, 6776
- [43] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Dalton 2014, 43, 158
- [44] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Cryst. Eng. Commun. 2014, 16, 3765
- [45] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Macroheterocycles 2015, 8(2), 113
- [46] Ovsyannikov A., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Macroheterocycles 2016, 9, 17.
- [47] Ovsyannikov A.S., Noamane M.H., Abidi R., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Cryst. Eng. Commun. 2016, 18, 691.
- [48] Kim K., Park S., Park K-M., Lee S.S. Cryst. Growth Des. 2011, 11, 4059
- [49] Bew S.P., Burrows A.D., Duren T., Mahon M.F., Moghadam P.Z., Sebestyen V.M., Thurston S. Chem. Commun. 2012, 48, 4824
- [50] Zhang Z., Drapailo A., Matvieiev Y., Wojtas L., Zaworotko M.J. Chem. Commun. 2013, 49, 8353.
- [51] Klein C., Graf E., Hosseini M.W., De Cian A., Fischer J. Chem. Commun. 2000, 239.
- [52] Ovsyannikov A.S., Lang M., Ferlay S., Solovieva S.E., Antipin I.S., Konovalov A.I., Kyritsakas N., Hosseini M.W. Cryst. Eng. Commun. 2016, 18, 8622.
- [53] Appelhans D., Stastny V., Komber H., Voigt D., Voit B., Lhotak P., Stibor I. Tetrahedron Lett. 2004, 45, 7145.
- [54] Sheldrick G.M. Program for Crystal Structure Solution. Göttingen: University of Göttingen, 1997.